

ABSTRACT OF THE DISCLOSURE

In a WCDMA mode, a mixer employed in a GSM/DCS orthogonal-modulation unit outputs a frequency of 380-MHz obtained as a result of division of a frequency generated by a fixed PLL loop unit by 2 without frequency transformation. The frequency of 380-MHz is further divided by 2 by a frequency divider to give a reference frequency of 190 MHz which is then supplied to a phase comparator employed in an offset PLL loop unit. In the offset PLL loop unit, on the other hand, an oscillation signal generated by a VCO for WCDMA use is mixed by a mixer with the oscillation signal generated by another VCO to give a frequency equal to a difference obtained as a result of subtraction of the oscillation frequency of the VCO for WCDMA use from the oscillation frequency of the other VCO. The difference-frequency signal output by the mixer is filtered by an LPF before being supplied to the phase comparator to be compared with the signal with the frequency of 190 MHz. Thus, the loop converges the oscillation frequency of the VCO for the WCDMA use to a value equal to a difference obtained as a result of subtraction of 190 MHz from the oscillation frequency of the other VCO.